



COMPLETED

I 49.77/4:995/1

RECOVERY PROGRAM FOR THE ENDANGERED FISHES OF THE UPPER COLORADO

12

CONTINUED

Spring/Summer 1995

Hatcheries top '95 fish recovery project list

(DENVER) — An endangered fish hatchery could be constructed in Colorado and two existing facilities in Utah expanded, following decisions made this fall in Denver by managers of a multi-agency program to recover rare Colorado River fish.

The Implementation Committee of the Recovery Program for Endangered Fish of the Upper Colorado River Basin approved a 1995 budget authorizing \$600,000 for construction of 6 to 12 additional holding ponds at an existing hatchery near Vernal, Utah.

The committee approved another \$300,000 for developing designs for a proposed new hatchery in Craig, Colo., and for possible expansion of the Wahweap State Fish Hatchery at Big Water, Utah, near the Arizona border.

"The Craig City Council is pleased that we may be able to help recover the fish," said Don Birkner, city manager of Craig. "In the long run, we also hope that the hatchery could provide information and education for the public and become a tourist attraction."



File photo, U.S. Fish and Wildlife Service

U.S. Fish and Wildlife Service Biological Technician Mike Baker places young Colorado squawfish in a hatchery pond near Fruita, Colo. Similar facilities could be constructed in Craig, Colo., and Big Water, Utah. These hatcheries would use a variety of wild adult fish to produce offspring for reintroduction in the natural river environment.

See HATCHERIES Page 2

INSIDE:

Director's message	Page 3
Common questions	Page 4
Impact studies	Pages 6-8
Mosquito control	Page 9
Landowner rights	Page 10
Biodiversity valuable	Page 11

Utah protects flows for fish

The Utah state engineer has set a new water-rights policy for the Green River which protects releases from Flaming Gorge Reservoir for endangered fish.

The policy applies to new applications and transfers into the reach of the Green River from Flaming Gorge Dam to the confluence with the Duchesne River. Water-right requests for this area will be granted subject to bypassing the flows required by the endangered fish from June 22 to Nov. 1.

Measured at Jensen, Utah, those flows are 1,100 to 1,800 cubic feet per second in summer and 1,100 to 2,400 cfs in fall.

"The policy was a cooperative effort among Recovery Program members," said Bob Morgan, Utah State Engineer. "Utah was allowed to identify and implement a method consistent with state water law, and in so doing, was able to protect existing water users as well as the flows for endangered fish."

442. 95-036392

\$900,000 approved to develop endangered fish hatcheries

HATCHERIES, from 1

Outdoor ponds would be used to raise endangered fish for future stocking efforts and field studies.

Biologists and engineers planning the Craig facility will finalize the proposed hatchery design, acquire necessary permits and complete requirements of the National Environmental Policy Act in 1995. Construction would start in 1996 and be completed in 1997.

"This is one of several actions in the Recovery Program's 1995 work plan that will provide direct and tangible benefits for endangered fish," said John Hamill, a U.S. Fish and Wildlife Service biologist who directs the Recovery Program.

Currently, there are two endangered fish hatcheries in the upper Colorado River Basin: one at the Ouray National Wildlife Refuge near Vernal, Utah, and one at Horsethief Canyon State Wildlife Area near Fruita, Colo. Two other facilities — a state Fish Research Hatchery in Bellevue, Colo., and a national hatchery in Valley City, S.D. — have been used temporarily to hold and propagate endangered fish. But the space available in these ponds totals only six acres. Biologists say another 20 acres are needed if all four fish species — razorback suckers, bonytail chubs, humpback chubs and Colorado squawfish — are to be maintained in separate ponds according to their genetic background.

Other 1995 projects are as follows:

- Construction is scheduled to start this summer on a fish ladder at the Redlands Diversion Dam on southwest Colorado's Gunnison River. Public review of the proposal has been completed and an environmental assessment finalized. A ladder would give the fish access to more than 50 miles of their historic range. The \$1 million project would be completed in the spring of 1996.

- The Colorado River Water Conservation District will develop a plan for protecting Yampa River flows for endangered fish while also providing water for human needs. Current plans call for accomplishing this by expanding Elkhead Reservoir, upstream of en-

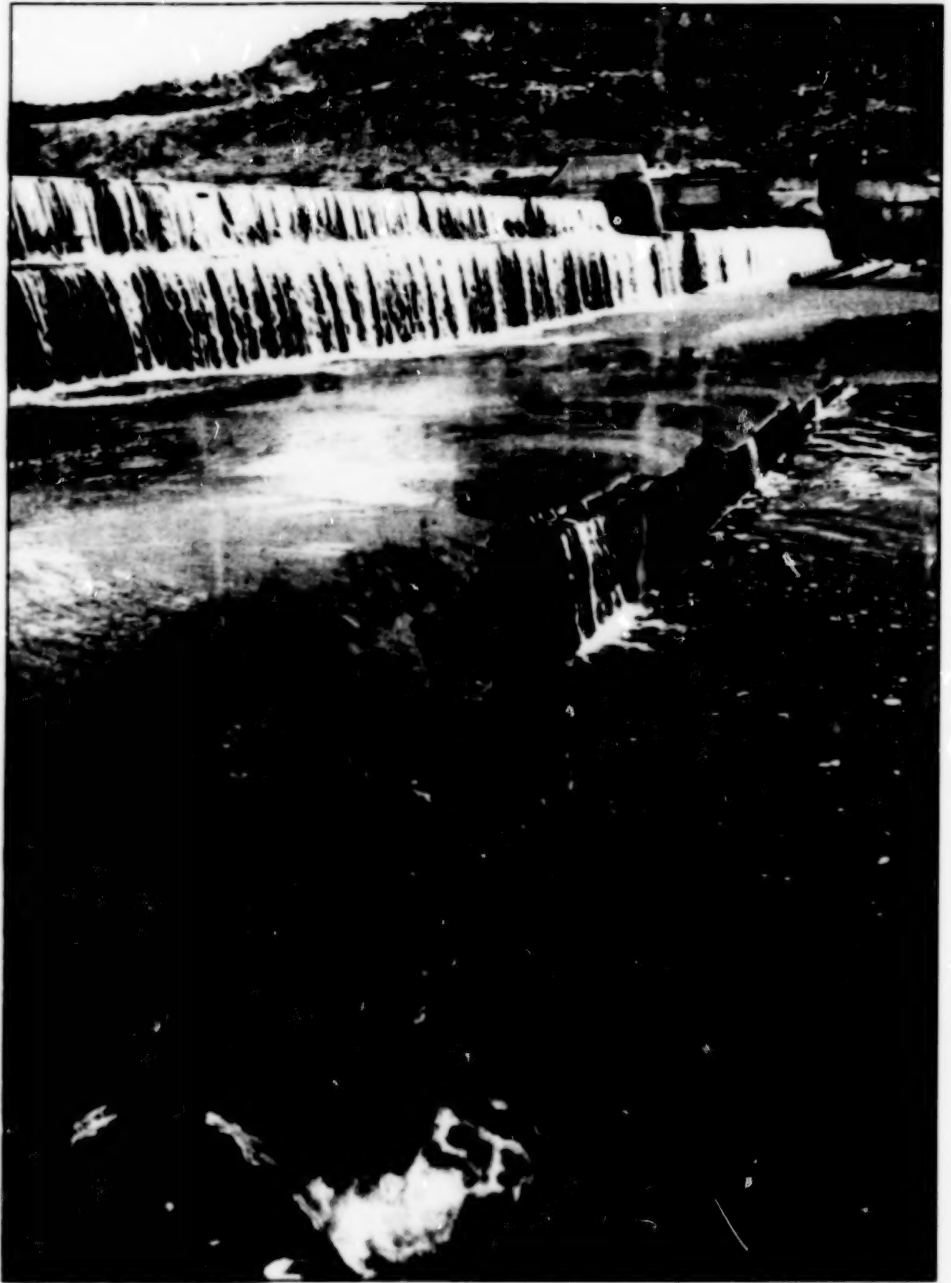


Photo by Connie Young

Redlands Water and Power Company built the diversion dam in 1918 to provide water for irrigation and hydroelectric power. Constructing a ladder around the dam would allow endangered fish to reclaim 50 miles of their historic range.

dangered fish habitat.

The total 1995 Recovery Program budget is \$8.5 million. More than half of that amount will pay for capital projects such as hatchery expansions, construction of the Redlands fish ladder and restoration of wetlands needed by young endangered fish.

"These costs should be considered in context of the billions of dollars spent altering the river to construct water projects for human needs," Hamill

said. "Many of these projects were done without consideration for their effects on native fish and wildlife. We are now trying to reverse some of the impacts of those developments."

The four species of endangered fish are at risk of extinction because of habitat changes caused primarily by construction of dams and introductions of exotic fish. Biologists believe the decline in native fish is an indicator of the health of the river environment.

Director's Message

By John Hamill

Recovery Program Director
U.S. Fish and Wildlife Service

Public Information

Recently, various interest groups, members of the public, and federal and state agencies have shown interest in actively participating in the Recovery Program.

Much of this interest is related to an increased emphasis on the implementation of recovery actions which have, at times, been controversial. Based on feedback we have received, the program has implemented a number of measures to keep people informed of events, activities and issues, including:

- A monthly calendar of events — events are open to the public.
- A status report on high-interest activities, issues or decisions will be issued two or three times a year.
- Continued public meetings throughout the basin to obtain public input on recovery activities. Meetings will be broadly publicized.



John Hamill

- Appropriate National Environmental Policy Act (NEPA) compliance will be conducted before major recovery actions are implemented. The public will have the opportunity to comment on the actions which affect the human environment.

If you would like to be on our mailing list, please contact Kathy Wall at (303)236-2985, extension 225.

New Staffing Plan

The scope and budget of the Recovery Program has grown significantly over the past several years as a result of increased emphasis on implementation of capital projects such as the construction of fish ladders and hatcheries, as well as the restoration of floodplain habitats, and acquisition of water and water rights for the fish.

Ensuring that these projects are implemented in a timely and cost-effective manner is a priority. A review of the program's management structure prompted a number of changes including:

- Responsibility for administration and staffing has been transferred from the management and technical committees to the director's office and the Bureau of Reclamation.
- Technical committees will focus on

providing advice and expertise to the management committee

- The director's responsibilities and staff have been increased to implement and administer the program.

Independent Peer Review

Recovery actions such as controlling non-native fish, restoring floodplain habitats and providing fish passage over diversion dams will be implemented for the first time in the upper basin. To ensure continued technical and scientific integrity, instream-flow studies, and genetics-management and floodplain-restoration activities will be independently reviewed by nationally and internationally recognized scientists who will provide advice on the program's overall direction.

Long-Term Funding

Program participants have been meeting with staff from the U.S. House of Representatives Resources Committee and members of the San Juan River Recovery Program to develop a mutually acceptable, politically viable mechanism for long-term funding. A recommended funding strategy to cover capital projects slated for the next eight years is scheduled to be developed by this fall.

Recovery Program for Endangered Fish of the Upper Colorado River Basin

The Recovery Program for Endangered Fish of the Upper Colorado River Basin is a 15-year, multi-agency program to re-establish self-sustaining populations of Colorado squawfish, humpback chubs, bonytail chubs and razorback suckers while providing for future water development.

Program participants are: the U.S. Fish and Wildlife Service; U.S. Bureau of Reclamation; Western Area Power Administration; states of Colorado, Utah and Wyoming; Environmental Defense Fund; National Audubon Society; Colorado Wildlife Federation; Wyoming Wildlife Federation; Colorado Water Congress; Utah Water Users Association; Wyoming Water Development Association and Colorado River Energy Distributors Association.

Mailing list available, letters to editor welcome

Letters to the editor

Signed letters to the editor will be published in this newsletter on a space available basis.

Mailing list

To be placed on the newsletter mailing list, please fill out the information below and send to the above address.

Your name: _____

Organization or agency, if any: _____

Address: _____

Comments? _____

Send letters to the editor and mailing list requests to: Colorado River Recovery Program, c/o U.S. Fish and Wildlife Service, P.O. Box 25486, Denver Federal Center, Denver, CO 80225, or fax to Colorado River Recovery Program at (303) 236-0027.

Common questions about endangered Colorado River fish

(Editor's note: The Recovery Program held public meetings in Delta, Gunnison and Grand Junction, Colo., last summer to discuss a proposed fish ladder at Redlands Diversion Dam, an interim contract to deliver water from Blue Mesa Reservoir for endangered fish and an agreement involving Taylor Park Dam operations. Below are several questions and responses from the meetings.)

Are you placing more importance on fish than people?

No. The needs of fish and people are closely related. In North America, 40 species and subspecies of fish have become extinct this century. The loss of Colorado River fish raises a red flag about degradation of one of the most unique river systems in the world. This ecosystem is home not only to endangered fish, but to eagles, waterfowl, other wildlife — and to people.

In addition, since the Recovery Program was created in 1988, the Fish and Wildlife Service has approved more than 190 water projects, which have directly benefited people in Colorado, Utah and Wyoming.

Why are you trying to save these fish when you tried to eradicate them a few years ago? Isn't that the reason they are now endangered?

The primary reasons the fish are endangered is because of construction of dams and introductions of non-native fish. However, in the mid-1960s, rotenone, a substance derived from the root of the derris plant, was used to reduce native fish populations and make way for non-native sport fish before closure of Flaming Gorge and Navajo dams. Follow-up studies found the total number of fish in these two locations had dropped, but the ratios of various species remained about the same. Researchers concluded there had been no lasting effect on native fish. Since then, the public has developed a greater awareness of the value of native species, and wildlife policies now reflect that attitude shift.

Why do you care about squawfish when in the Pacific Northwest, there are so many of them that government agencies are paying people to catch them?

The squawfish in the northwest are northern squawfish, an entirely different species of fish from Colorado squawfish, just as rainbow trout are different from cutthroat trout.

You say you want to build a fish ladder at Redlands Dam, but ladders in the Northwest have failed to help salmon. If they haven't worked there, why should they work here?

In fact, fish ladders are used very successfully by millions of adult salmon and other fish in the Northwest. (The decline in salmon is a result of other factors.)

Constructing a fish ladder at Redlands would follow a national trend toward using these structures to lessen environmental impact of dams. Colorado squawfish are strong swimmers accustomed to migrating through turbulent water. They congregate at the base of Redlands Dam and are expected to use the ladder. Only actual testing can determine the ladder's success.

If endangered fish use the ladder, so will other fish. Won't you cancel out any benefit for endangered fish?

To help prevent non-native fish from using the ladder, the Bureau of Reclamation will construct a fish trap at the upper end of the passage structure and will monitor the types of fish that swim through. It also may work to open the ladder only at certain times of year, such as during summer months when endangered fish migrate to and from the spawning area.

How much is the proposed fish ladder going to cost Redlands Water and Power Company?

The fish ladder will not cost Redlands anything. The project, which will cost around \$1 million, will be paid entirely with federal funds.

Will an environmental impact statement be prepared on the fish ladder?

The Bureau of Reclamation recently completed an environmental assessment, which found that the fish ladder poses no significant impact on the human environment.

The final environmental assessment on the Redlands fish ladder and interim flow protection is now available. For a copy, contact Jone Wright, Bureau of Reclamation, P.O. Box 60340, Grand Junction, CO 81506, (303) 248-0636.

What is being done to offset potential impacts of the Redlands fish ladder and Blue Mesa releases for endangered fish?

The Recovery Program will not take away any of Redlands' water rights. Redlands operates under a very senior water right and should not be significantly affected.

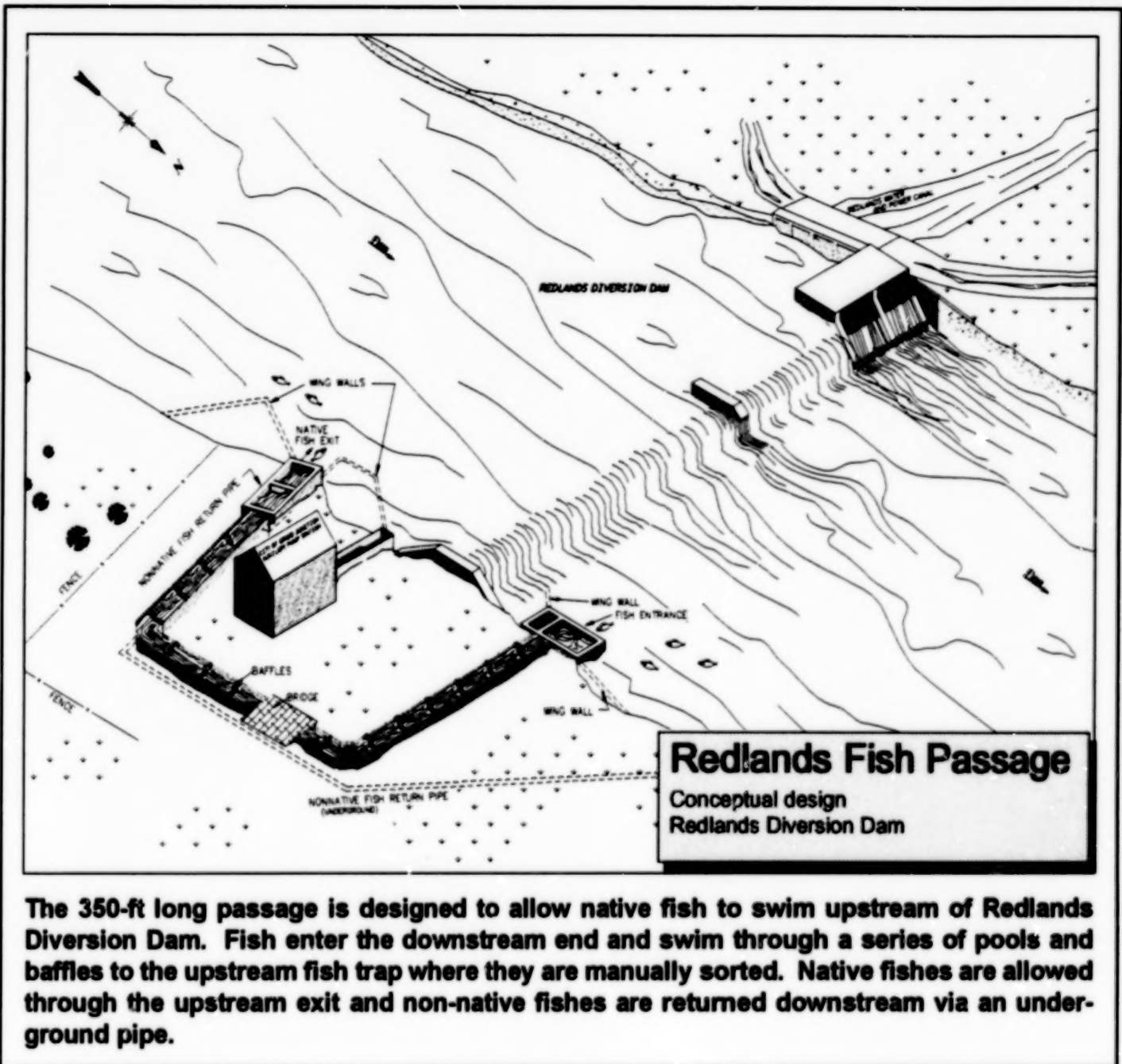
Shortages in water from Blue Mesa Reservoir have occurred historically and will continue to occur, regardless of efforts to protect flows for endangered fish. However, the Colorado Water Conservation Board, U.S. Fish and Wildlife Service and U.S. Bureau of Reclamation recently finalized a contract that includes protection of existing water rights. The approach being used will require that earlier in the year, Blue Mesa and other Aspinall Unit reservoirs be drawn down more frequently and to a greater extent than in recent years. While the contract cannot guarantee a full water supply for existing water rights, it should minimize future shortages.

Will construction of the fish ladder affect plans to build the Dominguez dam?

The proposed location of the Dominguez Dam lies within the area designated as critical habitat for endangered fish. Protection for the fish will exist whether or not the passage-way and interim contract are completed. Recovering the fish to the point that they can be removed from the en-

Fish ladder has little impact on human environment

COMMON QUESTIONS, from Page 4



The 350-ft long passage is designed to allow native fish to swim upstream of Redlands Diversion Dam. Fish enter the downstream end and swim through a series of pools and baffles to the upstream fish trap where they are manually sorted. Native fishes are allowed through the upstream exit and non-native fishes are returned downstream via an underground pipe.

dangered species list seems the most beneficial path for future water development.

Blue Mesa was built to benefit people. Why are you now using the water for endangered fish?

Blue Mesa was authorized to provide water for human use, produce hydropower and benefit fish, wildlife and recreation. 148,000 acre-feet of water was set aside in Blue Mesa for endan-

gered fish to offset water depletions from the Dolores and Dallas Creek projects. Without this action, these projects wouldn't have been approved.

How will Colorado's ability to utilize its Colorado River compact entitlement be affected by Blue Mesa releases for endangered fish?

Blue Mesa releases for endangered fish should have no adverse effect on Colorado's ability to develop its com-

pact allocation. The reservoir is drawn down every year to make space available to control spring runoff. Only the times at which water is released are impacted.

The state of Colorado intends to fully develop its share of water allowed under the Colorado River compact. The purpose of the Recovery Program — recovering endangered fish while allowing continued water development — supports that goal.

Striking a Balance:

Interactions between non-native and endangered fish in the upper Colorado River basin

During the past 100 years in North America, 40 species and subspecies of fish have gone extinct; another 364 fish species are threatened with extinction. Biologists believe the primary causes are habitat changes, such as construction of dams and introductions of non-native fish.

Only 14 fish species are native to the upper Colorado River Basin; eight of these are either listed as endangered or are candidates for listing. More than 40 non-native fish species have been introduced -- many adversely affect native Colorado River fish. For example:

- Studies on Utah's Duchesne River found that 1- to 3-year-old Colorado squawfish constituted 5 percent of the diets of northern pike, even though squawfish made up a small portion of the available food. A single northern pike can consume more than 100

and as much as 20 times the number of squawfish as green sunfish.

- Young Colorado squawfish have been found in the stomachs of channel catfish collected in the Dolores River, even though squawfish are very rare in this river. Also, research showed a handful of squawfish died trying to eat channel catfish whose spines became lodged in their mouths.

Recovery Program Involvement

Controlling the adverse effects of non-native fishes on endangered fishes is one of five major elements of the Recovery Program.

The Program recommends that stocking of non-native species be confined to areas where an absence of conflict with protected fish can be demonstrated. It also calls for the Service and states to develop procedures for resolving disagreements of fish-stocking recommendations.

Non-native fish stocking procedures

To address the sometimes competing goals of recovering endangered fish and stocking game fish, the Service and states of Colorado, Utah and Wyoming developed interim procedures for stocking non-native fish in

the upper Colorado River Basin to ensure that stocking of non-natives is compatible with recovery of endangered fishes. Highlights include:

- Trout species can be stocked without review anywhere in the upper Colorado River Basin, even though there may be minor adverse impacts on endangered fish.
- Smallmouth bass can be stocked without review upstream of the

dam and in certain standing waters separated from rivers occupied by endangered fish.

- Black crappie, bluegill, channel catfish and largemouth bass can be stocked without review in certain standing waters or isolated ponds and reservoirs.
- Proposals to stock walleyes, yellow perch, wipers or tiger muskies will be reviewed case-by-case according to stocking location, potential for the fish to escape into endangered-fish habitats, measures that could offset harm to endangered fish and other criteria.
- In Colorado, ongoing stocking of non-native fish, as allowed in existing lake-management plans, can proceed without review. This is the case for the following lakes and reservoirs: Rio Blanco, Hallenbeck, Mack Mesa, Chipeta Lakes, Crawford, Narraguinnep, Puett, Summit and Totten.
- In stretches of river currently occupied by endangered fish, stocking of non-native fish species other than trout is prohibited.

Issues regarding specific non-native fish species

Tiger muskies in Harvey Gap Reservoir -- The Colorado Division of Wildlife has proposed stocking tiger muskies in Harvey Gap, an isolated reservoir near Rifle. However, biologists believe muskies could have a significant negative impact if they were to come in contact with native and endangered fishes in the Colorado River Basin. The Fish and Wildlife Service and others will be reviewing the Division's proposal over the next 60 days.

Control of northern pike -- The Service and the Division of Wildlife are working together to remove northern pike from the Gunnison River. A similar effort planned for the Yampa River has been postponed for a year pending more public involvement and completion of a strategic plan for non-native fish control. ■

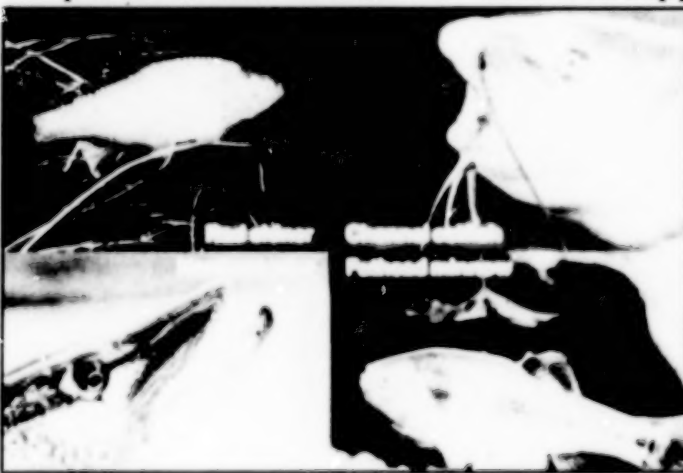


Photo by Perry Conway

More than 40 non-native fish species have been introduced -- many adversely affect native Colorado River fish.

squawfish per year.

- At least four studies have shown predation by channel catfish, green sunfish and carp on razor-back sucker eggs and larvae.
- Studies of predation on Colorado squawfish and various non-native fish, showed that largemouth bass exhibit a strong preference for native fish, eating twice as many young squawfish as red shiners

Flow Control:

Saving endangered fish and accommodating trout and kokanee in Flaming Gorge Reservoir

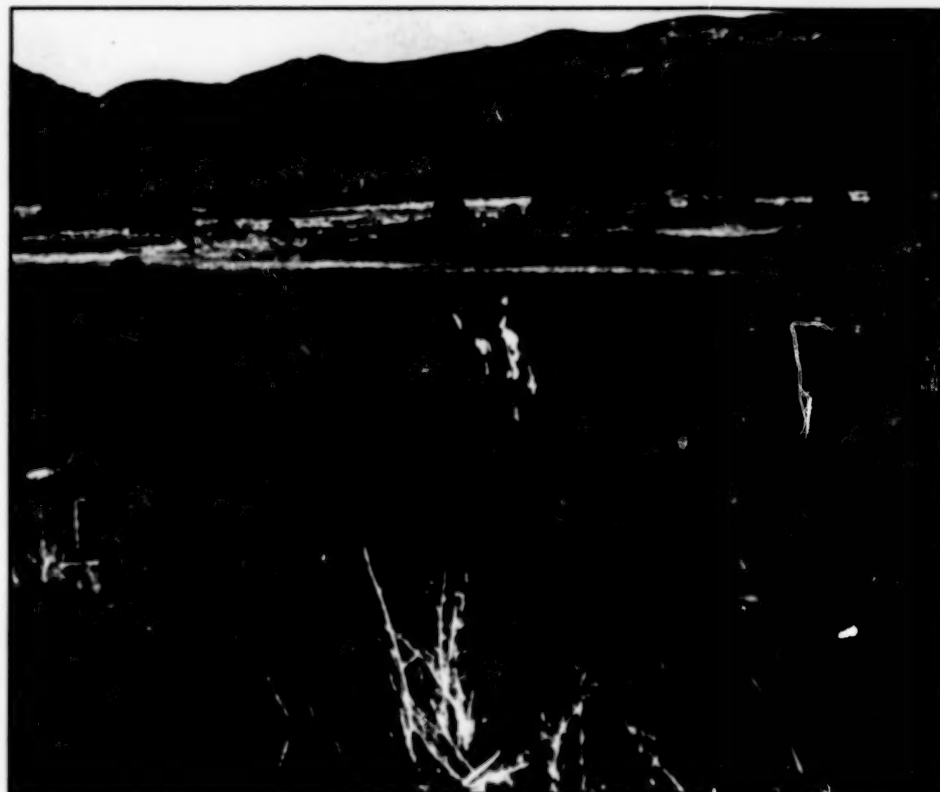


Photo by Connie Young

The scouring effect of somewhat higher releases freshens the river by removing decaying material from vegetation, cleaning spawning beds, increasing insect production and generally improving trout fishing opportunities.

In 1992, the Service issued an opinion on the operation of Flaming Gorge Dam, recommending a five-year experimental period of higher releases in the spring and lower, more stable flows in the summer.

Firm guidelines have not yet been established for winter flows. Releases will be varied each year to determine which flows are best for endangered fish.

Trout generally are not considered competitors with endangered fish and can be stocked anywhere in the upper Colorado River Basin. Additionally, releases aimed at benefiting endangered fishes will also benefit the trout fishery below the dam. In some cases however, river flows needed for endangered fish may not be ideal for trout. For example studies on the Green River revealed the following:

- Extremely high releases for an extended time period generally are

not beneficial to trout. The fish expend more energy trying to find slower moving waters. Also, trout do not grow as quickly in the colder water that results from these releases.

- However, a positive is that at somewhat lower levels, the scouring effect could "freshen" the river by removing decaying material from vegetation beds, cleaning trout spawning beds, improving the currently low insect production in the area and generally improving trout fishing opportunities.

- During high-water years, more water may have to be released in winter or early spring to make space for runoff from the next spring. This would come at a time when trout are least able to find and metabolize food and have less energy to find suitable water ve-

locities or stay in the same location in high-velocity water.

- In the past, flows fluctuated from 800 to 4,500 cfs each day for power production. Now, that more stable releases are being made for endangered fishes, trout fry have a better chance of surviving the summer and fishing conditions are more dependable.

- The Utah Division of Wildlife Resources has been stocking trout at various times in spring and early summer to determine which period produces the best survival and growth. Early results indicate stocking at the end of high spring flows is most successful.

- Below the dam, the survival rate of young rainbow and cutthroat trout is poor. Biologists believe this is because the area produces few of the backwaters young trout need and because high-energy demands have been placed on the fish when river flows have fluctuated to meet power needs.

Impacts on trout and kokanee in Flaming Gorge Reservoir

- Kokanee spawn from late October through November. When water is released during the winter, the reservoir level can drop below some of the kokanee spawning areas, killing eggs. However, biologists have recommended that winter releases be lower than in the past to stay in keeping with the needs of the endangered fish. They believe this measure will also help to preserve kokanee spawning sites.

- The voracious appetites of lake trout, however, are having an impact. They are consuming increasingly large numbers of kokanee — in the neighborhood of 900,000 annually.

- Both rainbow trout and bass appear unaffected by the changes in dam operations.



Improving Habitats:

Creating an environment on the Gunnison River where sport and endangered fish thrive

The U.S. Bureau of Reclamation has been changing the operation of the Aspinall Unit dams to remove river sediment and maintain a more natural river environment.

Dam releases are also varied each year, depending on the amount of water available, to study which flows work best for endangered fish.

Generally, releases mimic flow patterns that existed before dams were constructed, which means higher flows in the spring and lower, more stable flows the rest of the year.

In some cases, river flows needed for endangered fish may not be ideal for trout, however, generally the fish thrive. Observations include:

- High or "flushing" spring flows, and lower, more stable flows the rest of the year are beneficial to both endangered fish and trout. Higher flows flush out sediment, algae, vegetation and decaying material from the river bottom, boost insect production and improve the habitat by helping to maintain the natural state of both the river channel and flood plain habitats.
- Rapid changes in flow levels could harm trout populations if their fry get trapped in outlying vegetation as water levels recede. This becomes a bigger issue if water has to be "spilled" over the top of the dam, rather than released through the generators -- this happens about every other year on the Crystal dam. To avoid these sudden changes in flows, increases and decreases in water releases for endangered fish have been made gradually.

Additionally, the Service has worked closely with the Colorado Division of Wildlife to regulate peak flows to accommodate the hatching periods of rainbow and brown trout fry when possible.

- Since 1992, water-release patterns from the Aspinall Unit dams have been aimed at benefitting endan-

gered fish, yet overall rainbow and brown trout populations have increased.

- However, the emergence of whirling disease, caused by *Myxobolus cerebralis*, a microscopic, spore-forming amoeba that parasitizes the cartilage of certain species of trout and salmon, could have a significant impact on rainbow trout and some effect on brown trout. It isn't expected to affect trout or salmon in the reservoir, but state biologists will continue to study this.

Impacts on trout and kokanee in Blue Mesa Reservoir

- Adult kokanee have been growing larger. Biologists believe this may be occurring because many young kokanee are pulled through dam outlets during high spring releases, resulting in lower populations in the reservoir -- fewer fish can eat more and grow faster. Angler's benefit because as the food

base starts to drop, the fish become more aggressive and are easier to catch.

- Federal and state agencies are working to avoid the releasing very large amounts of water from the reservoir in a short period of time.

The high-volume discharge could decrease plankton production (fish food) and pull a large number of kokanee fry through the dam outlets.

- The number of kokanee eggs collected at the state's Roaring Judy Hatchery nearly doubled from 5.1 million in 1992 to an all-time record of 9.2 million in 1993. In 1994, biologists took 7.4 million eggs, making for another well-above-average year.
- Evaluation of protection policies on kokanee populations will continue through 1996 and will be considered in writing the biological opinion on Blue Mesa Dam.



Bureau of Reclamation photo

Dam releases are varied each year, depending on the amount of water available, to study which flows work best for endangered fish.

Vernal, Utah, gets \$15,000 for mosquito control

Residents of Vernal, Utah, and the surrounding area have fewer mosquitoes to swat, thanks to pest-control funding provided by a multi-agency program to recover endangered fish.

In response to concerns expressed by local citizens, the top-level committee of the Recovery Program for Endangered Fish of the Upper Colorado River Basin voted in September at its meeting in Denver to make a one-time contribution of up to \$15,000 to the Uintah County Mosquito Abatement District.

The district used the money in spring 1995 to curb mosquito production that can accompany water releases from Flaming Gorge Dam to benefit endangered fish.

The dam releases, combined with already high water from melting snowpack in the Yampa River, can force water over the banks and onto nearby flood plains, creating slow-water areas necessary for growth of young endangered fish. These same areas, however, are prime breeding grounds for mosquitoes.

"We are sympathetic to the public health concerns this situation creates for the local community, and in response, we are providing an interim source of money to address the problem," said John Hamill, a U.S. Fish and Wildlife Service biologist who directs the Recovery Program. "We are providing this as 'seed money' for 1995 only, with the understanding that the Mosquito Abatement District will look for other funding

'Spraying in this area kills hundreds of millions of mosquitoes and will make a tremendous difference to citizens.'

— Steve Romney, Ph.D.

sources for the future."

As local residents know, making



Managers of the Recovery Program for Endangered Fish of the Upper Colorado River agreed to provide as much as \$10,000 to the Uintah County Mosquito Abatement District for use in spring 1995. The money would help offset increased mosquito production that may occur if higher volumes of water are released from Flaming Gorge Dam for endangered fish.

even a dent in the number of mosquitoes in this flood plain is no small feat. The Ouray National Wildlife Refuge holds Utah's record for collection of these tiny tormentors. During an experiment there in 1978, scientists collected more than 400,000 mosquitoes in just one night.

The Mosquito Abatement District used the money to pay for aerial spraying along 56 miles of the Green River, from below Dinosaur National Monument to the town of Ouray, Utah. Workers completed most of the spraying in May and June, when mosquito breeding is at its peak, and will supplement with additional sprayings as needed through August.

"During spring, the Green River is the most productive of any mosquito habitat in the county," said Steve Romney, Ph.D., director of the Uintah County Mosquito Abatement District. "Spraying in this area kills hundreds of millions of mosquitoes and makes a tremendous difference to citizens."

The spray used is a larvicide called BTI (*bacillus thuringiensis israelensis*), a biodegradable, "environmentally-friendly" toxin that kills mosquito larvae but has almost no effect on

anything else, Romney said.

"BTI acts almost exclusively on mosquitoes, does not accumulate in the environment and is recognized by environmental experts as a safe alternative to traditional pesticides," he said. The active ingredient is a "crystalline protein endotoxin" produced by commercially grown bacteria.

In addition to being annoying pests to area residents and tourists, mosquitoes can create stress in livestock and occasionally transmit certain strains of encephalitis, potentially serious viral infections that can afflict people and horses, according to Romney.

Although Flaming Gorge Dam releases for endangered fish are aimed at increasing Green River flows in the spring, much of the river's water volume comes from melted snowpack in the free-flowing Yampa River.

For example, while in May 1993 Green River flows peaked at about 20,000 cubic feet per second, only about 2,000 cfs of that came from Flaming Gorge releases. The Yampa River contributed around 18,000 cfs. Before Flaming Gorge was built, Green River flows upstream of the Yampa averaged 7,800 cfs.

Landowner rights compatible with fish protection, officials say

To some Colorado River Basin residents, the phrases "endangered fish" and "critical habitat protection" may conjure up fearful images of federal officials calling a halt to all property owners' land management plans.

But residents in the region can put those drastic fears to rest, according to the U.S. Fish and Wildlife Service, the agency responsible for administering the Endangered Species Act.

"People may not understand what 'critical habitat' means," said Patty Schrader, a Service biologist who handles endangered species permits in Grand Junction, Colo. "If their land is within critical habitat for endangered fish, they may think their projects will be shut down or that the government will take their property.

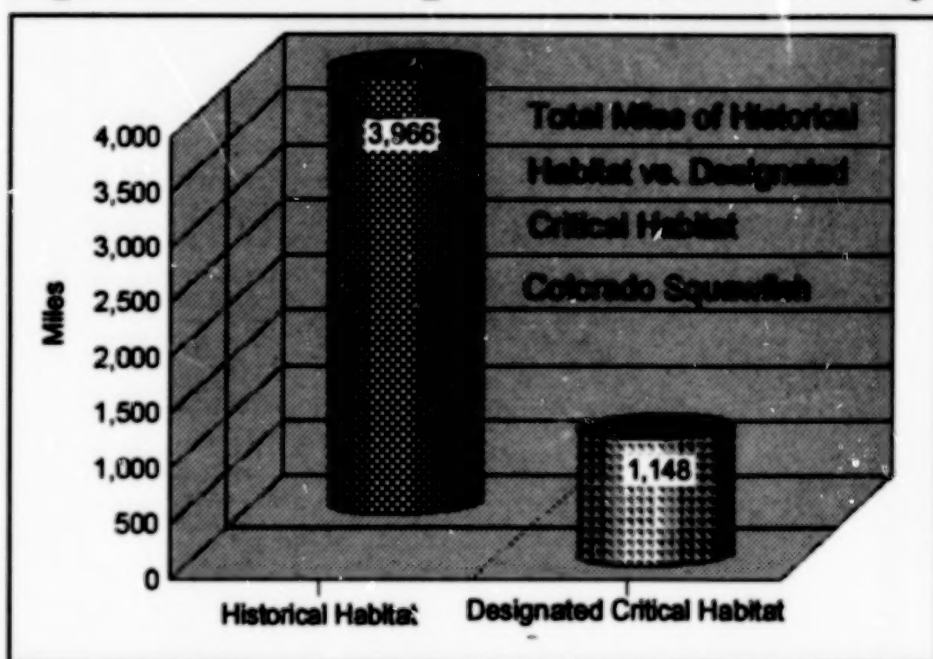
"But that's not the case. We almost always find an alternative solution."

The March 21, 1994, designation of 1,980 miles of critical habitat for endangered Colorado River fish under the Endangered Species Act was the outcome of a lawsuit by the Sierra Club Legal Defense Fund and a subsequent court order. In certain circumstances the Service now has more authority to protect the waters and land considered critical to the fishes' recovery.

"Our goal is to protect endangered fish habitat while also allowing for economic development and maintenance of sport fisheries," said Ralph Morgenweck, director of the Denver-based Mountain-Prairie Region of the U.S. Fish and Wildlife Service. "Some projects may not be compatible with our efforts to balance these concerns. But most can be made acceptable if landowners work with our field staff early in the proposal process."

For critical habitat rules to apply, there must be some type of federal involvement. Private landowners could be affected by critical habitat rules when their planned action requires federal authorization, such as a permit or license, or when they are receiving federal funding, including federal loans or Natural Resources Conservation Service money for constructing a pond.

For example, section 404 of the Clean Water Act generally requires landowners to obtain permits from the



The amount of habitat designated by the U.S. Fish and Wildlife Service for endangered Colorado River fish is only 30 percent of what existed originally.

U.S. Army Corps of Engineers when planning to stabilize a riverbank, excavate an area near waters in the 100-year flood plain or place "fill material" in the water or in a wetland. These types of action include dredging, filling in wetlands, mining for sand and gravel, constructing boat ramps and placing rocks in the river to build riprap, jetties or small dams.

"That doesn't mean all these activities are prohibited," Schrader said. "If the area does not provide all the elements needed by the fish, it would not be considered critical habitat, and the project would not affect the fish."

When a project's only impact to critical habitat is water depletion, the Service considers it to be offset by recovery actions undertaken by the Recovery Program, as long as the program continues to make sufficient progress in implementing those actions.

Even projects in areas important for the fish may be acceptable. It may be possible to complete gravel excavation projects that eventually would benefit endangered fish, explained biologist Mike Tucker.

If, after gravel is removed, river water could be channeled to flow through the excavation site, what once was an isolated gravel pit could become a backwater or other habitat needed by

endangered fish.

To obtain permits, landowners should contact the local office of the Corps of Engineers.

In the upper Colorado River Basin, critical habitat includes the Colorado River from Rifle, Colo., to Lake Powell; the Gunnison River from Delta, Colo., to Grand Junction; the Yampa River from Craig, Colo., to the Green River; and the White River from Rio Blanco Dam to the Green River; and the Green River from Dinosaur National Monument to Lake Powell.

Critical habitat is defined as all areas within the 100-year flood plain that provide the following:

- A sufficient quality and quantity of water needed by the fish at each life stage.

- Physical characteristics such as side channels, backwaters, flood plains and bottom lands, which are used by the fish as spawning, nursery, feeding and rearing sites.

- An adequate food supply and other biological factors.

"Endangered fish need habitats such as flooded bottom lands, oxbows, side channels and backwaters," Schrader said. "If these areas are cut off, filled in or stabilized, the fish don't have the habitat they need to complete all life stages and reach recovery."

River biodiversity rich, valuable, says conservationist

By Connie Young

Information & Education Coordinator
U.S. Fish and Wildlife Service

The atmosphere at the Environmental Defense Fund in Boulder, Colo., is casual. Some of the seven staffers dress in shorts, T-shirts and sandals. Dan Luecke, director of the Rocky Mountain Regional Office, sits in front of a framed print of various neckties. The caption reads, "In case of formality, break glass."

But the relaxed ambiance here belies Luecke's no-nonsense approach to environmental advocacy.

For 15 years, Luecke has marshaled the Environmental Defense Fund's efforts in the Rocky Mountain region, tackling tough issues such as the proposed Two Forks Dam, a 1-million-acre-foot project on the South Platte River that was to boost Denver's water supply. Opposed to the project, Luecke's organization instead advocated solutions such as water conservation, cooperation in developing water supplies and construction of projects with less potential for environmental harm. One such solution was the 60,000-acre-foot Wolford Mountain project, formerly called Muddy Creek Dam, now under construction near Kremmling, Colo.

"EDF's approach is to understand the scientific and technological underpinnings of an issue and then become involved in helping develop alternatives," Luecke explained. "We don't go in with litigation in mind."

In one of his more rewarding experiences, Luecke managed the construction of a waste water treatment project in Tijuana, Mexico. A cooperative project of his organization and *El Colegio de la Frontera Norte*, or College of the Northern Frontier, the facility now treats and recycles waste water for irrigation purposes.

"In most places, water is used once and then dumped in the ocean," Luecke said. "The ability to reuse water is especially important in Tijuana, which has a very limited water supply."



Photo by Connie Young

The Environmental Defense Fund's Dan Luecke heads up the organization's regional office in Boulder, Colo.

Luecke completed bachelor's and master's degrees in civil engineering at the University of Notre Dame in the 1960s. After a two-year stint in the U.S. Marine Corps, he enrolled in Harvard University, earning a doctorate in environmental science and engineering in 1971. He now lives in Boulder with his wife, Rosemary, a psychotherapist in private practice, and their 15-year-old son, Andrew.

Over the years, Luecke has served on 13 different boards and advisory committees, including the board of High Country News and the Denver Metropolitan Water Roundtable.

In addition, since 1990 he has served on the top-level committee of the Recovery Program for Endangered Fish of the Upper Colorado River Basin. Although Luecke said he would like to see more progress toward re-

covering the fish, he said the program is the best solution.

"The Colorado River program is a very good example of keeping shoulder to the wheel and continuing to push for solutions," Luecke said. "I would be less supportive if there were still substantial federal funding for building

'Where water is less abundant, river corridors are very rich places.'

— Dan Luecke

federal dams. But my view is that some water development can occur as long as there is a comprehensive recovery program for the fish."

The program's success hinges on meeting deadlines set in the Recovery Action Plan, according to Luecke. Key projects include changing the operation of Flaming Gorge and other federal dams and making flood plain areas accessible to the fish.

"It's not just that we need a certain number of CFS (cubic feet per second) in the river, but that we need a healthy ecosystem and a connection between the river and adjacent flood plains," he said. "The Recovery Program is the largest cooperative effort our office is involved in, and despite the differences among participants, we have maintained enough harmony to continue working together. I am optimistic that it can succeed."

Rafting in rivers of the West brings Luecke a sense of adventure, escape and appreciation for nature.

"Where water is less abundant, river corridors are very rich places," he said.

Regarding the Colorado River and its tributaries, he commented, "These resources are enormously valuable and rich; it's easy to see the important role they play in biodiversity in this part of the world. And the endangered fish are part of the fabric of life in the Colorado Basin. They deserve protection because of their inherent value."



Fish population trends reported

In a seven-year summary of efforts to monitor endangered fish populations in the upper Colorado River Basin, state and federal biologists reported several trends.

- Introduced non-native fish composed 75 to 99 percent of all fish collected. The most frequent non-natives were fathead minnow, red shiner and sand shiner.

- Young-of-the-year (newborn) Colorado squawfish were more abundant in the Green River than in the Colorado River.

- Razorback suckers have declined considerably in recent years. Only one razorback was captured in the White River, one in the Colorado and none in the Yampa. Biologists found them every year in the Green River, but the numbers appear to be dropping.

- Relatively large, apparently stable populations of humpback chubs exist in the Colorado River near the Utah-Colorado state line.

Program wins communication award

The Recovery Program for Endangered Fish of the Upper Colorado River won a second place award in a 1994 statewide communication contest. The Colorado chapter of the Public Relations Society of America honored the Recovery Program's Information and Education Program with a "Silver Pick" award in the category of public affairs programs.

Dams ease drought's impact on fish

Though dams have pushed some native Colorado River fish toward extinction, last summer they may have been the fishes' saving grace. Water releases from dams during last year's drought may have helped endangered fish survive one of the driest years on record.

- For example, at Northwest Colorado's Ruedi Reservoir, the Bureau of Reclamation released about 200 cfs of water in late summer to benefit endangered fish. During a similar year in the past, the river likely could have gone dry.

- In southwest Colorado on the Gun-



Photo by Ed Wick

Larval Fish Laboratory assistant Steve Meisner sorts, counts and measures larval fish collected from the Green River last summer. Researchers were excited to find 1,200 one-month old razorback suckers. Previously, the scientists had located only adult razorbacks more than 25 years old.

nison River, flows were kept near normal.

- The Green River was maintained at 1,600 to 1,800 cfs. In previous dry years, flows would have dropped to 800 cfs.

- In contrast, flows on the Yampa — where no dams exist — dropped as low as 8 cfs at Maybell, Colo. At that time of year, the Yampa normally flows at about 200 cfs.

Young razorbacks found in Green River

Biologists discovered more than 1,200 one-month-old razorback suckers in the Green River last summer. This find elated researchers, who previously had found old adult razorbacks, but very few young.

Researchers used traps specially equipped with lights to attract the fish. During May and June, the scientists placed the traps overnight in slow-moving areas in the Green River from Flaming Gorge Dam to Lake Powell. The larval fish, which are less than 1 inch long, swam toward the light and

through tiny slits in the trap. Before sunrise, researchers pulled the traps out of the water and removed the fish.

"Finding this many razorback larvae tells us there could be millions of them in the Green River," said Darrel Snyder at Colorado State University's Larval Fish Lab.

But nearly all of these young fish die before they are even 2 months old. The problem, researchers believe, is a combination of predation by red shiners, green sunfish and other non-native species, lack of adequate food in the river channel and dam-related changes in river flows. By removing dikes and other barriers between the river and nearby flood plains, water could flow in, carrying endangered fish along with it. Feeding in these nutrient-rich habitats would allow the young fish to grow large enough to stand a fighting chance in the river.

The Recovery Program is working to restore a number of these flood plain habitats.



END

04/25/97